

PORTABLE APPARATUS WITH OPENING/CLOSING LID AND TIMEPIECE ARMOR
ASSEMBLY FOR WATCH

BACKGROUND OF THE INVENTION

The present invention relates to a portable apparatus with opening/closing lid such as, for example, a wristwatch or pocket watch having openable/closable front lid, and a timepiece armor assembly for a watch having openable/closable front lid for instance.

As shown in Fig. 7A and Fig. 7B, among the portable apparatuses, for example the pocket watches, there is one having the openable/closable front lid. In Fig. 7A and Fig. 7B, a timepiece armor assembly denoted by a sign 1 is formed by a timepiece armor assembly main portion 2 and a front lid 3 pivotally connected to this timepiece armor assembly main portion 2. The timepiece armor assembly main portion 2 has a frame-like case band 4, a cover glass 5 mounted to a surface of the case band 4, and a case back 6 mounted to a back face of the case band 4. The front lid 3 is attached to the case band 4 through a pivot axle 7 so as to be opened or closed the cover glass 5.

Detailedly, as shown in Fig. 7B, the front lid 3 is provided with two short, cylindrical axle fitting portions 8 protruding from its circumference edge, and the case band 4 is provided with a short, cylindrical pivot axle supporting convex portion

9. The pivot axle supporting convex portion 9 is disposed between the two axle fitting portions 8, and both end portions of the pivot axle 7 penetrating through this pivot axle supporting convex portion 9 are respectively inserted into the axle fitting portions 8. Therefore, the front lid 3 can rotate about an axis of the pivot axle 7 over an opened position not covering a cover glass 5 and a closed position covering the cover glass 5.

Torsion springs 10 wound around the pivot axle 7 are respectively interposed between the pivot axle supporting convex portion 9 and the axle fitting portions 8. The torsion spring 10 is provided from its free state to wound state and, as shown in Fig. 7A, one end portion 10a butts against the circumference edge of the front lid 3 and the other end portion 10b butts against the surface of the case band 4 and is supported thereby. By this constitution, since a spring force of the torsion spring 10 is given to the front lid 3 through one end portion 10a, the front lid 3 is always biased in its closing direction. Therefore, the front lid 3 can be maintained so as not to be opened carelessly. As to this pocket watch, a user can see a dial and the like by pressing and opening the front lid 3 by means of his/her finger against the spring force of the torsion spring 10.

Further, in a conventional portable apparatus with lid, two hinge portions protruding from a case are provided, and

two-step through-hole is formed in this hinge portion. After a pin has been loosely fitted to the two-step through-hole of the hinge portion, of one side, protrusively provided in a case main body, and an elastic body, such as urethane resin, previously maintained in a through-hole provided in a connecting base of the lid has been inserted through the pin, a split pipe is fitted to a tip of the pin under a state that the tip of the pin faces an inside of a large diameter portion of the two-step through-hole of the hinge portion of the other side. In this manner, the lid is connected to the case main body (refer to, for example, Patent Document 1, JP-A-7-248387 Gazette, pages 2-3, Figs.1-3)

Hitherto, since the torsion spring 10 disposed between the axle fitting portion 8 and the pivot axle supporting convex portion 9 is exposed, by the fact that it is seen, it is liable to give an unsightliness in external appearance.

As to the constitution in which the front lid 3 is biased in its closing direction, the both end portions 10a, 10b of the torsion spring 10 used therefor are exposed to an outside of the front lid 3. In this case, there is the fact that, as shown in Fig. 7(A), one end portion 10a is slightly exposed from a surface of the front lid 3 by a dispersion in length of the both end portions 10a, 10b, a dispersion in thickness of the front lid 3, and the like. Under such a situation, there is a fear that one end portion 10a and the like are caught by

user's finger, clothes and the like when handling and the like.

As mentioned already, as to the constitution in which the front lid 3 is biased in its closing direction, there is no device for limiting an opening of the front lid 3 at a predetermined open position. Therefore, if the front lid 3 is excessively opened, the spring force of the torsion spring 10 becomes weak by an excessive load accompanying thereby, so that there is a fear that a function of always maintaining the front lid 3 to its closed state is decreased.

Accordingly, a problem to be solved by the present invention is to provide a portable apparatus with opening/closing lid and a timepiece armor assembly for watch, each of which can improve the external appearance, in each of which clothes and the like are not caught by the end portion of the spring biasing the opening/closing lid, and each of which can maintain the biasing function for the opening/closing lid by the spring.

SUMMARY OF THE INVENTION

A premise of the present invention is a portable apparatus with opening/closing lid, in which to a frame-like portion of an apparatus armor main portion there is rotatably attached, through a pivot axle, the opening/closing lid for opening or closing individually a front face or a back face or both of these faces of the main portion, and this opening/closing lid

is biased in its closing direction or opening direction by a spring.

And, the present invention for solving the above problem is characterized in that the opening/closing lid is provided with a cylindrical axle fitting portion rotatably fitting to the pivot axle, a spring accommodating hole facing this axle fitting portion is provided in a position biased from an axle center of the pivot axle of the frame-like portion, the spring consisting of a coil spring is accommodated in this spring accommodating hole under its compressed state, and the opening/closing lid is biased by giving a spring force of this spring to the axle fitting portion.

In the present invention and each invention mentioned below, the frame-like portion of the apparatus armor main portion and the opening/closing lid can be made of a metal or a synthetic resin and, in case of the synthetic resin, they can be made of one having a transparency capable of seeing therethrough an inside not limited opaque one. In the present invention and each invention mentioned below, the spring accommodating hole extends in a thickness direction of the frame-like portion and can be provided approximately perpendicularly to an axis of the pivot axle (there is included a case where the axis is perpendicular or slanted at an angle less than 10° approximating to a perpendicularity). In case where the spring accommodating hole is provided perpendicularly, it is excellent in a point

that it is unnecessary to increase an outer diameter of the frame-like portion by increasing a wall thickness along a radial direction of the frame-like portion. In case where the spring accommodating hole is slantingly provided, it is excellent in a point that such a design becomes possible that a lever action given to the opening/closing lid is easily developed by largely ensuring a distance between a line of force of the spring and the axle center (fulcrum) of the pivot axle. In the present invention, a biasing force of the coil spring can be directly given to the axle fitting portion by causing one end portion of this spring to contact with the axle fitting portion or, by interposing a transmission body between one end portion of the coil spring and the axle fitting portion, the biasing force of the coil spring can be indirectly given to the axle fitting portion through this transmission body.

In the present invention, since the biasing force of the spring is applied to the axle fitting portion possessed by the opening/closing lid in a position biased from the axle center of the pivot axle, the opening/closing lid can be biased in a predetermined direction by the lever action whose fulcrum is made the pivot axle. The spring bearing this biasing force is the coil spring, and is accommodated in the spring accommodating hole of the frame-like portion possessed by the apparatus armor main portion. Since this spring accommodating hole faces the axle fitting portion, the whole coil spring is

substantially covered and concealed by the frame-like portion and the axle fitting portion such that the coil spring is not exposed to an outside of the apparatus armor main portion and, by covering an end portion of the coil spring in the vicinity of the axle fitting portion by means of the axle fitting portion, this end portion can be made so as not to protrude to the outside of the apparatus armor main portion. And, in case where the opening/closing lid biased in its closing direction is excessively opened for instance, a load applied accompanying this to the coil spring is proportional to a distance from the axle center of the pivot axle to an outer circumference face of the axle fitting portion, but there is no fact that an excessive force greater than a certain constant quantity is applied to the coil spring because the axle fitting portion is cylindrical.

In a preferred mode of the present invention, the transmission body having a convex curved face contacting with the axle fitting portion is interposed between the spring and the axle fitting portion. In this mode, the transmission body may be a pin-like one only whose tip portion is semispheric or has an approximately inverted U-shape in section, or it may be a solid sphere which is spherical as a whole, and this transmission body can be made of a metal or a synthetic resin.

In this mode, by using the transmission body, it become easy to accurately determine the point of force by the coil spring with respect to the axle fitting portion, and the coil

spring in the spring accommodating hole can be covered and concealed from the axle fitting portion side by this transmission body.

In a preferred mode of the present invention, an outer circumference region, of the axle fitting portion, facing the spring accommodating hole accompanying the fact that the opening/closing lid biased in its closing direction is opened from its closed state is formed in an arc face. In this mode, it is desirable that the outer circumference region of the axle fitting portion is formed by the arc face whose radius from the axle center of the pivot axle is an equal distance, but it may be formed by an arc face the radius of which slightly, gradually increases or gradually decreases.

In this mode, in case where it is attempted to excessively open the opening/closing lid, since the outer circumference region formed by the arc face of the axle fitting portion faces the spring accommodating hole, the opening/closing lid can be further opened while suppressing an excessive force from being applied to the coil spring. Consequently, it can be adapted such that no excessive load is given to an attaching portion of the opening/closing lid.

In a preferred mode of the present invention, plural flat pressure-receiving outer circumference regions continuous in a circumferential direction are provided in the outer circumference face of the axle fitting portion.

In this mode, on the occasion of an opening/closing motion of the opening/closing lid, every time a corner portion formed between the adjoining pressure-receiving outer circumference regions passes over the point of force of the coil spring, a momentary compression and release of the coil spring is performed, so that it is possible to give a click feeling.

The portable apparatus with opening/closing lid of the present invention can be implemented for a pocket watch or wristwatch, which is a watch. Accordingly, the watch of the present invention has such advantages that an external appearance is improved, clothes and the like are not caught by an end portion of the spring biasing the opening/closing lid, and a biasing function for the opening/closing lid by the spring can be maintained.

Further, a premise of the present invention is an armor assembly for watch, in which to a case band of a timepiece armor main portion there is rotatably attached, through the pivot axle, a front lid for opening or closing a surface of the main portion, and this front lid is biased in its closing direction by the spring.

And, the present invention for solving the above problem is characterized in that the front lid is provided with the cylindrical axle fitting portion rotatably fitting to the pivot axle, the spring accommodating hole facing this axle fitting portion is provided in the position biased from the axle center

of the pivot axle of the frame-like portion, the spring consisting of the coil spring is accommodated in this spring accommodating hole under its compressed state, and the front lid is biased by giving the spring force of this spring to the axle fitting portion.

In this invention, since the biasing force of the spring is applied to the axle fitting portion possessed the front lid in the position biased from the axle center of the pivot axle, the front lid can be biased in the predetermined direction by the lever action whose fulcrum is made the pivot axle. The spring bearing this biasing force is the coil spring, and is accommodated in the spring accommodating hole of the case band of the timepiece armor main portion. Since this spring accommodating hole faces the axle fitting portion, the whole coil spring is substantially covered and concealed by the case band and the axle fitting portion such that the coil spring is not exposed to the outside of the timepiece armor main portion and, by covering the end portion of the coil spring in the vicinity of the axle fitting portion by means of the axle fitting portion, this end portion can be made so as not to protrude to the outside of the timepiece armor main portion. And, in case where the front lid biased in its closing direction is excessively opened for instance, the load applied accompanying this to the coil spring is proportional to the distance from the axle center of the pivot axle to the outer circumference face of the axle

fitting portion, but there is no fact that the excessive force greater than the certain constant quantity is applied to the coil spring because the axle fitting portion is cylindrical.

BRIEF DESCRIPTION OF THE DRAWINGS

A preferred embodiment of the invention will now be described with reference to the accompanying drawings wherein:

Fig.1 is a plan view showing a watch according to a 1st embodiment of the present invention;

Fig.2 is a sectional view showing, along a line F2 - F2 in Fig. 1, a part of the watch under a state that a front lid has been closed;

Fig.3 is a sectional view showing, along the line F2 - F2 in Fig. 1, a part of the watch under a state that the front lid has been opened;

Fig.4 is a plan view showing, in an enlarged scale, an F4 portion in Fig. 1;

Fig. 5A is a sectional view showing a part of a watch according to a 2nd embodiment of the present invention under the state that the front lid has been close;

Fig.5B is a sectional view showing a part of the watch according to the 2nd embodiment of the same under the state that the front lid has been opened;

Fig. 6A is a sectional view showing a part of a watch according to a 3rd embodiment of the present invention under

the state that the front lid has been closed;

Fig.6B is a sectional view showing a part of the watch according to the 3rd embodiment of the same under the state that the front lid has been opened;

Fig. 7A is a sectional view showing a part of a watch according to a conventional example under the state that the front lid has been closed; and

Fig.7B is a plan view showing, in an enlarged scale, a front lid attaching portion of the watch of Fig. 7A.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Hereunder, a 1st embodiment of the present invention is explained referring to Fig. 1 - Fig. 4.

In Fig. 1, a sign 21 denotes a wristwatch, for instance, as a portable apparatus with opening/closing lid, and this wristwatch 21 is formed while accommodating a timepiece movement 23 (refer to Fig. 2) as a built-in part in a timepiece armor assembly 22 as an apparatus armor assembly.

As shown in Fig. 2 and Fig. 3, the timepiece armor assembly 22 has a timepiece armor main portion 25 as an apparatus armor main portion, a front lid 26 as an opening/closing lid, and a coil spring 27 for biasing this front lid 26 in its closing direction.

The timepiece armor main portion 25 is formed while making a surface of the timepiece armor main portion 25 by bonding

a transparent cover glass 32 to one face in thickness direction of its frame-like case band 31 by means of an adhesive, and making a back face of the timepiece armor main portion 25 by mounting, for example, an opaque metal-made case back 33 to the other face in thickness direction of the case band 31. The cover glass 32 covers a dial.

Although the case band 31 is formed in an approximately annulus ring form by an opaque material such as a metal, in case where it is made a see-through type, the case band 31 may be formed by a transparent synthetic resin. In Fig. 2 and Fig. 3, a sign 34 denotes an annular rubber gasket for sealing. Incidentally, to the case band 31 there are respectively attached a winding stem pipe (not shown in the drawing) while penetrating through a part of the case band in a radial direction, and a crown 35 (refer to Fig. 1) connected to a winding stem of the timepiece movement 23 while being inserted into this pipe from an outside.

As shown in Fig. 4, in a position spaced by about 180° from the crown 35 of the case band 31, there are respectively provided a pivot axle supporting convex portion 36 and, while being positioned in both sides of this, a pair of spring accommodating holes 37. To the pivot axle supporting convex portion 36, there is attached penetrating in its width direction a pivot axle 38.

As shown in Fig. 2 and Fig. 3, the spring accommodating

hole 37 is drilled in a thickness direction of the case band 31 while extending in a direction perpendicular to an axis A (refer to Fig. 4) of the pivot axle 38. Each of these spring accommodating holes 37 has a tapered hole bottom, and an opening 37a opened to one face of the case band 31 to which the cover glass 32 has been mounted. A center axis B of each spring accommodating hole 37 deviates from an axle center C of the pivot axle 38 in a radial direction of the case band 31. That is, in this embodiment, both of the spring accommodating holes 37 are provided while being biased toward an outside in the radial direction of the case band 31 by a deviation dimension D with respect to the axle center C.

The front lid 26 is made of, for example, a metal or synthetic resin, and has a circular shape somewhat smaller than the case band 31. The front lid 26 is provided with a pair of axle fitting portions 41 protruding from its circumference edge. These axle fitting portions 41 have a short cylindrical shape of approximately the same shape as the axle supporting convex portion 36. By inserting respectively end portions of the pivot axle 38 into each of a pair of axle fitting portions 41 disposed with the pivot axle supporting convex portion 36 being placed between them, the front lid 26 is attached so as to be rotatable about the pivot axle 38 with this being made a fulcrum. By this rotation, the front lid 26 can move over an opened position exposing the cover glass 32 and a closed

position covering and concealing the cover glass 32.

A pair of axle fitting portions 41 attached while fitting to an outer circumference of the pivot axle 38 respectively face openings 37a of the spring accommodating holes 37 so as to close them, and are disposed just above the openings 37a in Fig. 2 and Fig. 3. In an outer circumference face of the axle fitting portion 41, there is provided one flat pressure-receiving outer circumference region 42 while forming a part of the outer circumference face. Additionally, within the outer circumference face of the axle fitting portion 41, an outer circumference region 41a, which faces the opening 37a of the spring accommodating hole 37 accompanying the fact that the front lid 26 is opened, is formed by an arc face continuous to the pressure-receiving outer circumference region 42. This outer circumference region 41a becomes the arc face whose radius from the axle center C of the pivot axle 38 is an equal distance. In Fig. 2 and Fig. 3, a sign 31a denotes a clearance portion formed in the case band 31 so as not to hinder a rotation of the axle fitting portion 41.

In each spring accommodating hole 37, there are accommodated the coil spring 27, and a transmission body 45 supported by one end portion of this coil spring 27. Outer diameters of the coil spring 27 and the transmission body 45 are approximately equal to an inner diameter of the spring accommodating hole 37, and therefore center axes of the coil

spring 27 and the transmission body 45 approximately coincide with the center axis B of the spring accommodating hole 37. The coil spring 27 is incorporated under its compressed state under which the transmission body 45 is butted against the outer circumference face of the axle fitting portion 41, and the other end is butted against the hole bottom of the spring accommodating hole 37. Therefore, a spring force of the coil spring 27 is always given to the axle fitting portion 41 through the transmission body 45, and thereby the front lid 26 is biased in its closing direction. The transmission body 45 has a pin-like form, its tip portion is formed in a convex curved face, e.g., hemispherical form, and it contacts with the outer circumference face of the axle fitting portion 41 by this convex curved face.

As to the wristwatch 21 having the above constitution, a state that the front lid 26 has been closed so as to hinder a seeing of the dial is shown in Fig. 2. Under this state, the pressure-receiving outer circumference region 42 which is a part of the outer circumference face of the axle fitting portion 41 faces so as to obturate the opening 37a of the spring accommodating hole 37, and the transmission body 45 is pressed to this pressure-receiving outer circumference region 42 by the spring force of the coil spring 27. Therefore, the front lid 26 receives a clockwise biasing force in Fig. 2, and is maintained in its closed state. In this case, since the

transmission body 45 is pressed to the flat pressure-receiving outer circumference region 42, a predetermined force is required in order that the transmission body 45 is transferred to the outer circumference region 41a, of the axle fitting portion 41, consisting of the arc face beyond a corner portion denoted by a sign 41b in Fig. 2, so that the front lid 26 is suppressed by a moderation of the predetermined force from being opened carelessly.

In order to see the dial, it is possible by counterclockwise opening the front lid 26 by means of a hand with the pivot axle 38 being made the fulcrum. A state that the front lid 26 has been opened is shown in Fig. 3. Under this opened lid state, the pressure-receiving outer circumference region 42 of the outer circumference face of the axle fitting portion 41 is disengaged from the transmission body 45, and the arc-like outer circumference region 41a of the axle fitting portion 41 contacts with the transmission body 45.

Therefore, even if the front lid 26 is greatly opened further, the coil spring 27 does not generate excessively compressing by its motion, and it is possible that no large load is given to the front lid 26. Consequently, since the coil spring 27 and an attaching portion of the front lid 26 are suppressed from being injured and the spring force of the coil spring 27 does not generate weak as well, it is possible to maintain the biasing function for the front lid 26 by the coil

spring 27 for a long period of time.

In the wristwatch 21 having the above constitution, as mentioned already, the coil spring 27 biasing the front lid 26 is accommodated in the spring accommodating hole 37 of the case band 31. In particular, in this embodiment, the transmission body 45 covers the coil spring 27 from the axle fitting portion 41 side. Accordingly, the coil spring 27 is not exposed outside the timepiece armor main portion 25. Moreover, in this embodiment, since the case band 31 and the like are opaque, it is possible that the coil spring 27 and the transmission body 45 in the spring accommodating hole 37 cannot be seen from an outside. Therefore, the decrease in the external appearance of the wristwatch 21 by the coil spring 27 becomes null, so that it is possible to give a high grade sensation to the wristwatch 21.

In addition to this, as mentioned already, since the coil spring 27 is not exposed outside the timepiece armor main portion 25, there is no fear that the end portion of the coil spring 27 is caught by the user's finger and clothes, etc. in various handling, etc. during the wristwatch 21 is carried, so that it is desirable.

Additionally, since the biasing force of the coil spring 27 is extended to the axle fitting portion 41 through the transmission body 45, it is easy to accurately determine the point of force of the coil spring 27 with respect to the axle

fitting portion 41. By this, it becomes easy to suppress the dispersion of the biasing force for the front lid 26, so that it is possible to stabilize a quality of the wristwatch 21.

Fig. 5A and Fig. 5B show a 2nd embodiment of the present invention. Since this embodiment has basically the same constitution as the 1st embodiment, the same sign as the 1st embodiment is applied as to the same constitution, and explanations of that constitution and the action are omitted and hereunder it is explained about different portions.

In the 2nd embodiment, the axle fitting portion 41 of the front lid 26 is made a polygonal cylindrical form and, in its outer circumference face, there are continuously provided plural flat pressure-receiving outer circumference regions, e.g., pressure-receiving outer circumference regions 42a, 42b, in a circumferential direction of the axle fitting portion 41. By this, a corner portion 43 is formed between the adjoining pressure-receiving outer circumference regions 42a, 42b. Incidentally, it is desirable to provide three or more flat pressure-receiving outer circumference regions. Further, in this 2nd embodiment, from a relation that the polygonal cylindrical body is adopted in the axle fitting portion 41 usually brazed to the front lid, the flat faces forming a polygonal shape are provided in place of the outer circumference region consisting of the arc face, of the axle fitting portion 41, adopted in the 1st embodiment, but it is also possible to

make these portions by the arc faces.

The constitution other than that mentioned above is the same constitution as the 1st embodiment. Accordingly, also in the 2nd embodiment, the problem of the present invention can be solved similarly to the 1st embodiment. Moreover, in this 2nd embodiment, since the axle fitting portion 41 has the polygonal cylindrical form, when opening or closing the front lid 26, the momentary compression and release of the coil spring 27 is performed every time the corner portion 43 passes over the point of force of the coil spring 27. By this, it is possible to give a definite click feeling.

Fig. 6A and Fig. 6B show a 3rd embodiment of the present invention. Since this embodiment has basically the same constitution as the 2nd embodiment, the same sign as the 2nd embodiment is applied as to the same constitution, and explanations of that constitution and the action are omitted and hereunder it is explained about different portions.

In the 3rd embodiment, the spring accommodating hole 37 is provided in the case band 31 while being biased toward an inside in radial direction of the case band 31 by the deviation dimension D with respect to the axle center C of the pivot axle 38. By this, it is formed such that the spring force of the coil spring 27 accommodated in the spring accommodating hole 37 is exerted to the axle fitting portion 41 through the transmission body 45, and the front lid 26 is biased

counterclockwise in Fig. 6A and Fig.6B, in other words, in a direction along which the front lid 26 is opened.

Incidentally, in a portion, of the case band 31, adjoining the crown, there is provided a push type lock button biased by a not-shown spring in a direction protruding from an outer circumference of the case band 31 and, corresponding to this, a free end portion of the front lid 26 is provided with an engaging portion engaged with or disengaged from the lock button. By closing the front lid 26, the engaging portion engages with the lock button, so that the front lid 26 can be maintained in its closed state. Conversely to this, by pressing the lock button, since the engagement between this button and the engaging portion is released, the front lid 26 can be opened by the biasing force of the coil spring 27.

Further, in the outer circumference face of the polygonal cylindrical axle fitting portion 41 of the front lid 26, 1st - 3rd flat pressure-receiving outer circumference regions 42a - 42c are continuously provided in the circumferential direction of the axle fitting portion 41. By this, the corner portions 43 are formed respectively between the mutually adjoining 1st, 2nd pressure-receiving outer circumference regions 42a, 42b and between the 2nd, 3rd pressure-receiving outer circumference regions 42b, 42c.

The constitution other than that mentioned above is the same constitution as the 2nd embodiment. Accordingly, also

in the 3rd embodiment, the problem of the present invention can be solved similarly to the 2nd embodiment and, when opening or closing the front lid 26, it is possible to give the definite click feeling.

The present invention is not limited to each of the above embodiments. For example, in an implementation as the watch, it can be applied also to a case where to a timepiece body main portion there is attached an opening/closing lid as a back cover for opening or closing a back face of the former, or a case where to the timepiece body main portion there are attached the opening/closing lid as the back cover for opening or closing the back face of the former together with an opening/closing lid for opening or closing a front face of the same, and the like.

According to the present invention, since the coil spring biasing the opening/closing lid in a predetermined direction is not exposed outside the apparatus armor main portion, the external appearance can be improved and, since the end portion of the coil spring is not protruded to the outside of the apparatus armor main portion, there is no fear that the user's clothes and the like are caught by this end portion of the spring and, moreover since no excessive force is given to the coil spring even if the opening/closing lid is excessively opened in case where the coil spring biases the opening/closing lid in its closing direction for instance, it is possible to provide the

portable apparatus with opening/closing lid, in which the biasing function for the opening/closing lid by the spring can be maintained.

According to the invention adapted such that the coil spring in the spring accommodating hole is covered and concealed from the axle fitting portion side by the transmission body, it is advantageous in a viewpoint of realizing the improvement in the external appearance and in a viewpoint of preventing the clothes and the like from being caught by the end portion of the spring and, since it is easy to accurately determine the point of force by the coil spring with respect to the axle fitting portion, it is possible to provide the portable apparatus with opening/closing lid, in which it is easy to suppress the dispersion of the biasing force for the opening/closing lid.

According to the invention adapted such that no excessive force is given to the coil spring in case where the opening/closing lid is excessively opened, it is possible to provide the portable apparatus with opening/closing lid, in which no excessive load is given to the attaching portion of the opening/closing lid.

According to the invention in which the plural flat pressure-receiving outer circumference regions continuous in the circumferential direction are provided in the outer circumference face of the axle fitting portion, it is possible to provide the portable apparatus with opening/closing lid,

in which the definite click feeling is given on the occasion of the opening/closing motion of the opening/closing lid.

According to the invention in which the portable apparatus with each opening/closing lid is realized as the watch, it is possible to provide the watch whose external appearance can be improved, in which the clothes and the like are not caught by the end portion of the spring biasing the opening/closing lid, and in which the biasing function for the opening/closing lid by the spring can be maintained.

According to the present invention, since the coil spring biasing the front lid in the predetermined direction is not exposed outside the timepiece armor main portion, the external appearance can be improved and, since the end portion of the coil spring is not protruded to the outside of the timepiece armor main portion, there is no fear that the user's clothes and the like are caught by this end portion of the spring and, moreover since no excessive force is given to the coil spring even if the front lid is excessively opened in case where the coil spring biases the front lid in its closing direction for instance, it is possible to provide the timepiece armor assembly for watch, in which the biasing function for the front lid by the spring can be maintained.